

A2 Flight Control System

User Manual v1.20

April 2015 Revision

Thank you for purchasing DJI products. Please strictly follow these steps to mount and connect this system on your aircraft, install the PC Assistant Software on your computer, as well as installing the DJI Assistant App on your mobile device.

Please regularly check the web page of corresponding products on our website www.dji.com, which is updated regularly. Product information, technical updates and manual corrections will be available on this website. Due to unforeseen changes or product upgrades, the information contained in this manual is subject to change without notice.

* This manual is for basic assembly and configuration; you can obtain more details and advanced instructions when using the Assistant Software. To assure you have the latest information, please visit our website and download the latest manual and current software version.

If you have any problems that you cannot solve during usage, please contact your authorized dealer.

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Introduction

Product Introduction

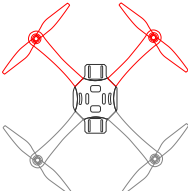
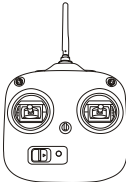
The DJI A2 Multi-Rotor stabilization controller is a complete flight system for various multi-rotor platforms for commercial and industrial aerial photography. Based on the technology and design philosophy of DJI's Ace series of high-performance controllers, the A2 offers you a brand new flight experience. Its flight mode provides a seamless transition for current Ace One, WKM AP professionals. A2 features includes:

- (1) Integrated with high-precision sensor components and a high-performance GPS Receiver.
- (2) Utilizes high quality components precisely calibrated with temperature compensation in all gyros and sensors, industry renowned flight algorithm in autopilot and UAV field.
- (3) Designed with built-in vibration absorption, no extra mount frame or vibration absorption pad is required.
- (4) Provide high precision control and high performance handling experience.
- (5) Based on the DESST technology, it has a built-in 16-channel Receiver, and supports DSM2 satellite receiver.
- (6) Optional DJI D-BUS Adapter can be used with a traditional Receiver.

In the Box

<p>Controller Unit (Built-in Receiver DR16)</p>	<p>PMU(Power Management unit)</p>	<p>IMU(Inertia Measurement Unit)</p>
		
<p>LED-BT-I</p>	<p>GPS-COMPASS PRO PLUS</p>	<p>Accessories</p>
		<p>Micro-USB Cable (1) Servo Cables (2) GPS Bracket Double side sticky pads.</p>

Equipment Prepared by Users

<p>Aircraft (Take Quad-rotor for example: Red is nose, and Black is rear)</p>	<p>Transmitter (Take Mode2 for example)</p>	<p>Others</p>
		<p>Battery DJI D-BUS Adapter Mobile Device</p>

System Introduction

The A2 flight control system uses the Controller Unit at its core, which is connected with the IMU, GPS-COMPASS PRO PLUS, LED-BT-I, PMU and ESCs to complete the system. The system can achieve the height-lock and position-lock functions by using the IMU and the GPS, to control the aircraft.

Please carry out the following procedures to finish assembly, configuration and flight-testing.

Mount the A2 flight control system on your aircraft finish connection.

Configure the system using A2 Assistant software.




Basic flying test

FailSafe and Low-voltage settings


Advanced functions: IOC, Gimbal, Gear


Symbol Instruction


General Symbol


	Forbidden(Important)		Cautions		Tips		Reference
	GPS Satellite number		Distance		TX signal good		TX signal lost
	Roll to left		Roll to right		Pitch up		Pitch down

LED Symbol

	N=1	N=2	N=3	N=4	N=6	N=20	N=∞
Meaning	One Blink	Two Blinks	Three Blinks	Four Blinks	Six Blinks	Twenty Blinks	Continuous Blinks

e.g.  (3) means three Red blinks.

 (∞)LED blinks yellow and green alternatively.

	N=∞
Meaning	Continuous Solid on

e.g.  (∞) means Continuous Blue Solid on.

1 Assembly and Configuration

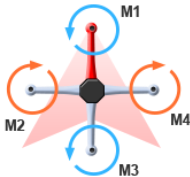
For hardware installation, software configuration and compass calibration please adhere to the following sections.

1.1 Hardware Installation and Connection

- (1) Please adhere to “1.1.1 Mixer Type Supported” to choose a mixer type and assemble your aircraft.
- (2) Please adhere to both “1.1.2 Hardware Connection Diagram” and “1.1.3 Important for Assembly and Connection” to install and connect all units on your aircraft.

1.1.1 Mixer Type Supported

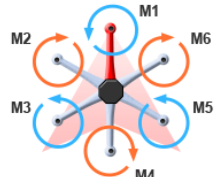
Following Mixer Types are supported.



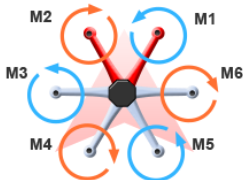
Quad-rotor I



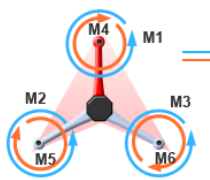
Quad-rotor X



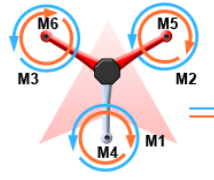
Hexa-rotor I



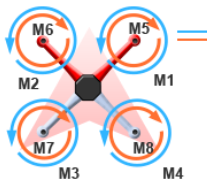
Hexa-rotor V



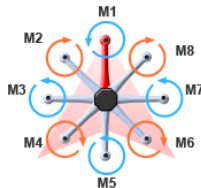
Hexa-rotor IY



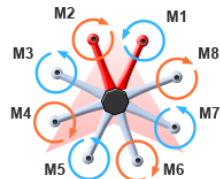
Hexa-rotor Y



Octo-rotor X



Octo-rotor I



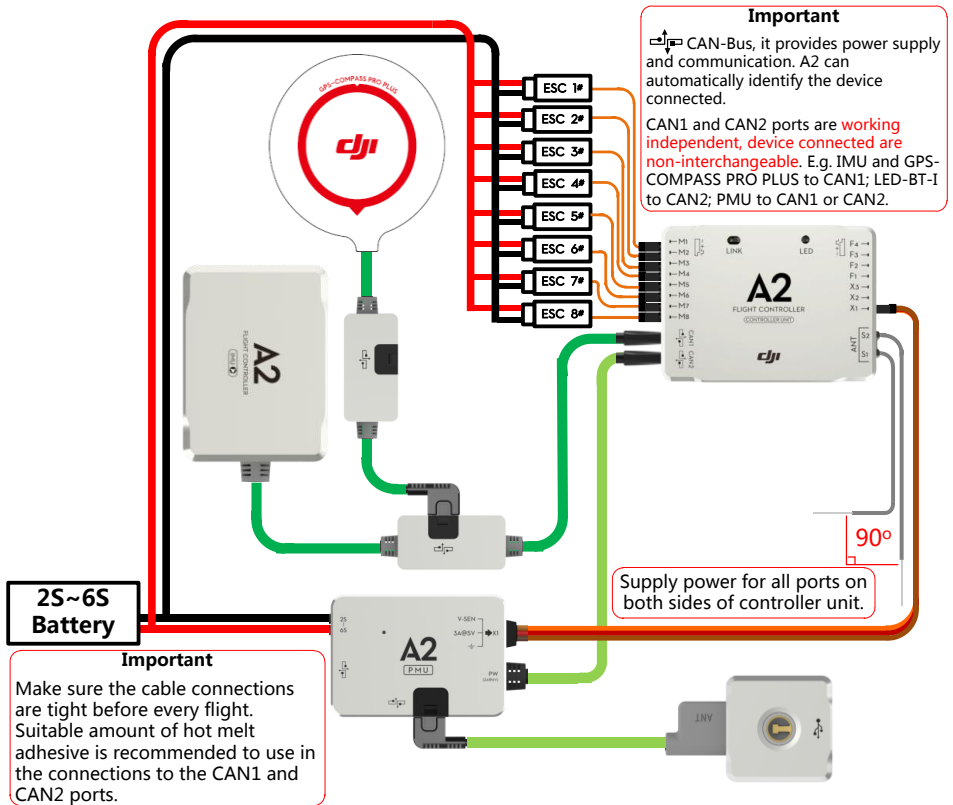
Octo-rotor V

The direction of the arrow in diagram indicates the rotation direction of the motor/propeller.



For coaxial propellers: Blue propeller is at TOP; Red propeller is at Bottom. Otherwise all propellers are at top.

1.1.2 Hardware Connection Diagram



1.1.3 Important for Assembly and Connection

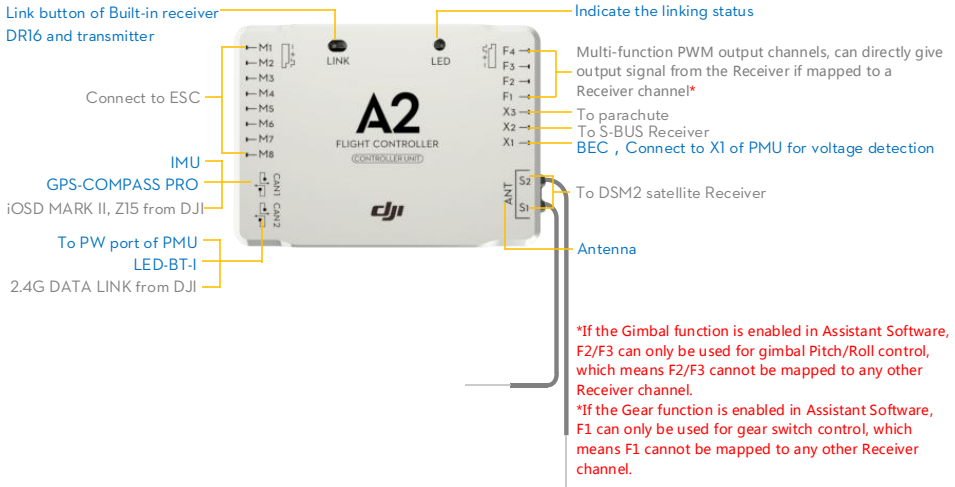
This section describes all device port functions, assembly requirements, connection requirements and tips during usage. Also the linking procedures between the built-in Receiver DR16 and your Transmitter. **Please read all information below carefully, especially if you are a first time user.**

(1) Controller Unit

The Controller Unit is the core component of the A2 flight control system:

- (1) M1-M8 are used to connect to the ESCs of the aircraft.
- (2) The built-in Receiver DR16 is based on DJI DESST technology, which can be used with the Futaba FASST series and DJI DESST series Transmitter.
- (3) CAN1 and CAN2 ports are working independently and should connect to different modules.
- (4) 4 independent and configurable outputs.
- (5) It is compatible with the external Receiver, e.g. DSM2 satellite Receiver.
- (6) Use the optional DJI DBUS Adapter to support the traditional receiver.

Port Description



Mounting Requirements:

Install the Controller Unit in the proper position to make sure the ports are accessible. No specified direction is required.



Place the antennas in an open space under the aircraft, DO NOT block them. Position the heads of two antennas at a 90-degree angle. DO NOT bend or wind them.

Receiver System

The A2 flight control system can use its own built-in Receiver, and also can support external receivers. Whatever type of Receiver is used, please make sure that the Receiver and Transmitter is linked correctly before use.

A. Built-in Receiver

For enhancing the system integration and reliability, the A2 is integrated with a 2.4G receiver based on frequency hopping technology. The built-in Receiver can be used with the Transmitter of Futaba FASST series or DJI DESST series after linking. For users, you are only asked to carry out the link procedures, no extra requirement for connection.

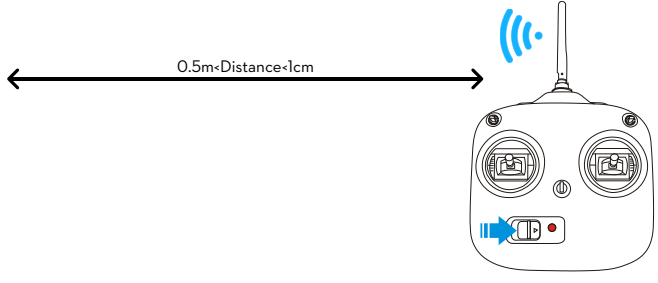
Please carry out the following procedures to finish the Link process, and the configuration in the **A2 Assistant software**->**Basic** ->**R/C** ->**Receiver Type**. Select the **DRI16** option.


During use, you may see the following LED indication, please do the operation according to the table below.

LED	Description	Operation
● (α)	Signal from Transmitter has been detected by the Receiver, but not matched.	Link operation required
■ (α)	No Transmitter signal is received, e.g. the flight control system is powered on but the Transmitter is powered off.	Switch on
■ (α)	The Receiver and Transmitter have been linked to each other successfully.	Can work normally



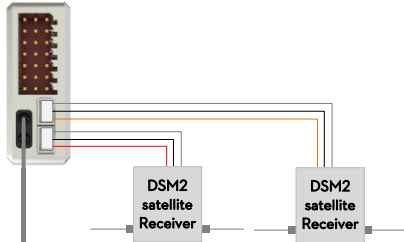
Link Procedures
1. Turn on the transmitter, it begins to send signals after 1.5secs.
2. Power on the flight control system, configure the Receiver type as DR16 in the Assistant software.
3. Press the LINK button, hold for 2secs, wait until the LED blinks Red ●.
4. Release the LINK button, the LED turns Green on after successfully linking.



 The DR16 Receiver is compatible with the Futaba transmitters which have optional FASS MODE MULT, MLT2 or 7CH. Users can find out more available Futaba transmitters and configuration requirements refer to the FAQ->The Transmitter setup of FUTABA.


B. DSM2 Satellite Receivers

If using DSM2 satellite Receivers, please follow the diagram for connection, set the Receiver referring to your Receiver manual, and select the Receiver type as **DSM2** in the **Assistant software->Basic->R/C-> Receiver Type**.



Linking procedures
1. Power on the flight control system, the Transmitter should be turned off.
2. Set the Receiver type as DSM2 in the Assistant software.
3. Press and hold the LINK button on the controller unit the LED blinks red ● and the indicators on the Receivers blink too. Then release the LINK button the Receiver will be ready for linking.
4. Press and hold the linking button on the Transmitter then turn on the Transmitter to start linking, release the button after the Transmitter is displayed Linked or the indicators on the Receivers are solid on.
5. The LED on the controller unit will be solid green on after linking successfully.

Notes for the DSM2 users:

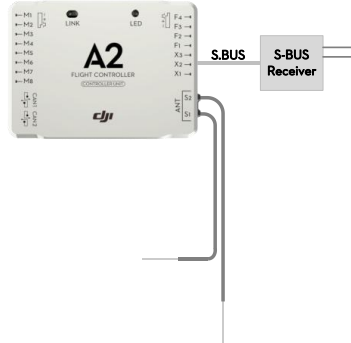
 ● There is no need to enable the FailSafe function in the Transmitter. If the Receiver loses the signal from the Transmitter, the controller unit will enter into FailSafe automatically, and the aircraft will

hover or Go-home as configure in the FailSafe in the Assistant software.

- When using the dual-mode Transmitter, please set the transmitting mode as DSM2 in SYSTEM SET UP->FRAME RATE ->MODE, which should not be DSMX.
- Support DSM2 satellite Receivers used with all SPEKTRUM Transmitters, e.g. DX6I DX7S DX8 DX18 etc., as well as JR Transmitters, e.g. DXS9II DXS11.

C. S-BUS Receivers

If using S-BUS Receivers please follow the diagram for connection, set the Receiver referring to your Receiver manual, and select the Receiver type as **D-BUS** in the **Assistant software->Basic->R/C-> Receiver Type**.



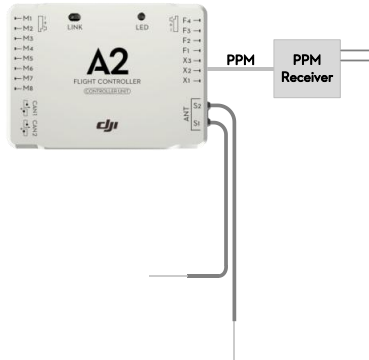
Notes for the S-BUS users:



- It is no need to enable the FailSafe function in the Transmitter. Once the Receiver loses the signals from the Transmitter, the controller unit will enter into FailSafe automatically, and the aircraft will hover or Go-home as configurations of the FailSafe in the Assistant software.

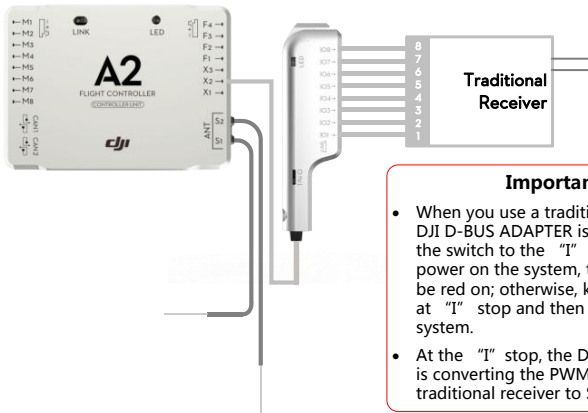
D. PPM Receivers

If using PPM Receivers please follow the diagram for connection, set the Receiver referring to your Receiver manual, and select the Receiver type as **PPM** in the **Assistant software->Basic->R/C-> Receiver Type**.



E. Traditional Receivers


If using Traditional Receivers, the DJI D-BUS Adapter is required. Please follow the diagram for connection, set the Receiver referring to your Receiver manual, and select the Receiver type as **D-BUS** in the **Assistant software->Basic->R/C-> Receiver Type**.



Important

- When you use a traditional receiver, DJI D-BUS ADAPTER is required. Put the switch to the "I" stop, and power on the system, the LED should be red on; otherwise, keep the switch at "I" stop and then power cycle the system.
- At the "I" stop, the D-BUS ADAPTER is converting the PWM signal from traditional receiver to S-BUS signal.

Notes for the traditional receiver users:

- When using the traditional receiver which doesn't have endpoint adjustment operations to set FailSafe in the U channel, the Go-Home switch is recommended and users can use it to trigger the FailSafe.
-  Configure the FailSafe function of your transmitter and receiver according to its instructions, set the FailSafe position of the Go-Home switch in the position triggering the FailSafe function. If it is configured correctly as mentioned above, the FailSafe function will be activated automatically if the receiver loses the signal from the transmitter.
- Users can get more information about the FailSafe function referring to [3.1 FailSafe](#) in this manual and the help text in the Assistant software.

(2) IMU (Inertial Measurement Unit):

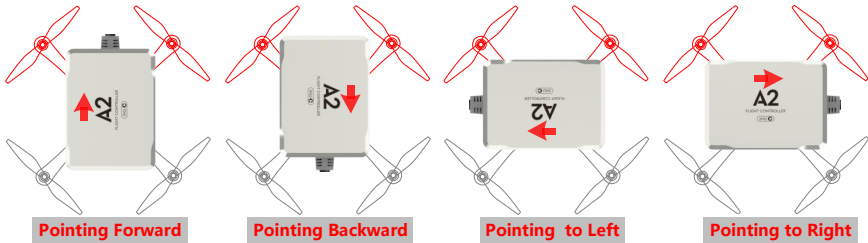
Built-in inertial sensors, for the measurement of aircraft attitude; built-in pressure sensor for the detection of aircraft altitude. Should be connected to the CAN1 port of the Controller Unit, and be mounted according to the required location and orientation. The IMU has been calibrated before delivery, it should be used under the specified temperature; otherwise the temperature may have an effect on the IMU performance.

Working environment temperature: -5°C ~60°C

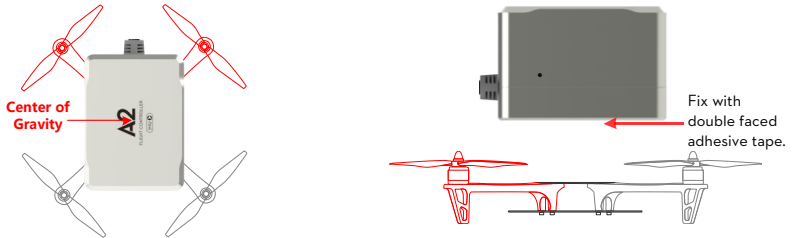
Storage environment temperature: -60°C

Orientation Requirements:

Please mount the IMU as one of the following options. Configure in the **A2 Assistant software** ->**Basic** ->**Mount** ->**IMU**, and select the matched option.



Location Requirements:



- (1) The top side should be facing up. DO NOT mount upside-down.
- (2) DO NOT cover the ventilation holes, keep them unblocked and clean.
- (3) Take heat preservation measures if working in cold weather.



- (1) Mount the IMU at a low vibration position and the sides of the IMU should be precisely parallel to the aircraft body. Based on our experience, there is less vibration near the aircraft's center of gravity.
- (2) NOT water-proof or oil-proof.
- (3) Check the double faced adhesive tape regularly to make sure that the IMU is fixed firmly.

There is a CAN-Bus connector, which can be used to connect to the GPS-COMPASS PRO PLUS or other DJI product.



(3) GPS-COMPASS PRO PLUS

GPS-COMPASS PRO PLUS module has a built-in GPS and compass. The compass is used for geomagnetic field measurement. It should be mounted according to the required location and orientation. Compass calibration is required before use. DO NOT use and store the compass in the ferromagnetic material environment.

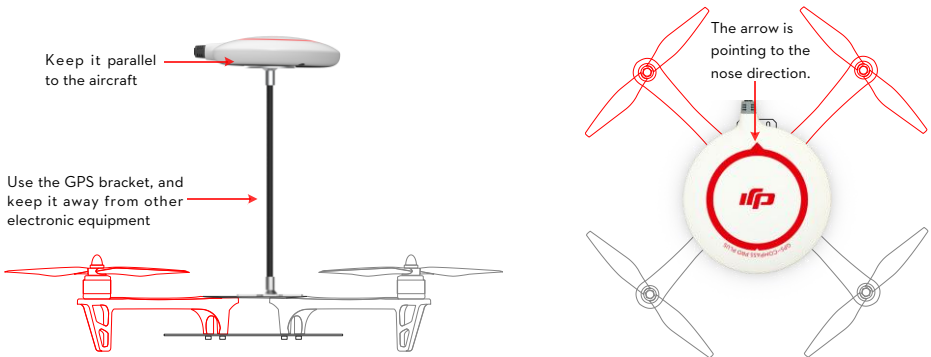
Mounting Procedure:

- a) Use the epoxy resin AB glue to assemble the GPS bracket first. The longest one is recommended.



- b) Mount the bracket on the aircraft first, and then fix the GPS-COMPASS PRO PLUS on the plate of the bracket (using the 3M sticky pads provided).

Mounting Position:



Usage Requirements

- (1) The DJI logo should be facing the sky, with the orientation arrow pointing directly to the nose direction; otherwise it may lead to **take off failure**.
- (2) Fly the aircraft in an open space without buildings or trees; otherwise it may have an effect on the GPS.
- (3) The compass is sensitive to magnetic interference, should be far away from electronic devices, otherwise it may lead to **abnormal flying**.
- (4) Please always keep the compass module away from magnet fields. Otherwise it may damage the compass module and lead the aircraft to work abnormally or even be out of control.



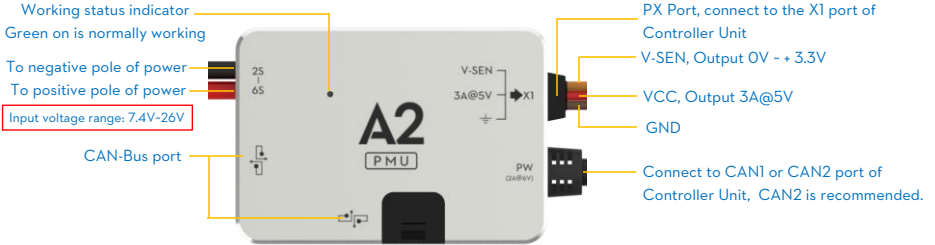
(4) PMU (Power Management Unit)

The PMU provides dual BECs (Battery Eliminator Circuit):

- (1) PW port outputs power for the whole Flight Control System with current no more than 2A.
- (2) PX port outputs power (3A@5V) and V-SEV signal using the low voltage protection function.

In addition, there are two CAN-Bus ports for LED-BT-I connection and other DJI products (e.g. DJI 2.4G Data Link).

Port Description



Mounting Requirements:

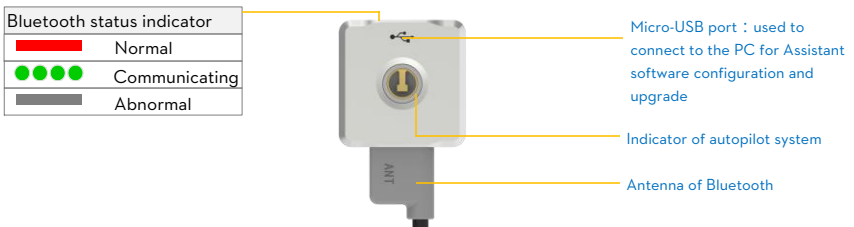
Choose a ventilated place to mount the PMU for cooling, no mounting orientation requirement.

(5) LED-BT-I

The LED-BT-I has integrated LED Indicator, Bluetooth and USB port:

- (1) The LED is mainly for flight control system status indication during flying (e.g. Control Mode).
- (2) Bluetooth is used for real-time communication with your mobile device (e.g. iPhone), to realize parameter configuration on a mobile device. For parameter configuration using a mobile device, it is required to install the DJI Assistant App on the mobile device. When you mount the LED-BT-I, please make sure the side with ANT LOGO is unsheltered after mounting.
- (3) In addition, there is a Micro-USB port, make sure it is mounted for convenient connection.

Port Description:



Mounting Requirements:

Mount in a good place to make sure the LED is visible during flying. Antenna of Bluetooth should be unobstructed.

1.2 Software Installation and Configuration


Please configure the A2 flight control system in the Assistant Software according to the following instructions.

Users are required to configure every item within the “Basic” page when use the A2 flight control system for the first time.

1.2.1 Installing Driver and Assistant Software

Installing and running on Windows

1. Download driver installer and Assistant Software installer in **EXE** format from the download page of A2 on the DJI website.
2. Connect the A2 flight control system to a PC via a Micro-USB cable. The Micro-USB port of the A2 flight control system is on the LED-BT-I module.
3. Run the driver installer and follow the prompts to finish installation.
4. Next, run the assistant software installer and follow the prompts to finish installation.
5. Double click the A2 icon on your Windows desktop to launch the software.

 The installer in EXE format only supports Windows operating systems (Win XP, Win7, Win8 (32 or 64 bit)).

Installing and running on Mac OS X

1. Download the Assistant Software installer in **DMG** format from the download page of A2 on the DJI website.
2. Run the installer and follow the prompts to finish installation.



3. **When launching for the first time** if use Launchpad to run the A2 Assistant software, Launchpad will not allow access because the software has not been reviewed by Mac App Store.



4. Locate the A2 icon in the Finder, press the Control key and then click the A2 icon (or right-click the A2 icon using a mouse). Choose Open from the shortcut menu, click Open in the prompt dialog box and then the software will launch.
5. After the first successful launch, direct launching of the software can be achieved by double-clicking the A2 icon in the Finder or using Launchpad.



Installer in DMG format supports only Mac OS X 10.9 or above.

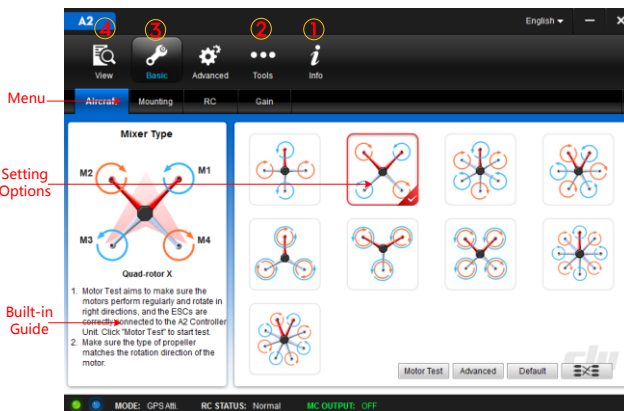


Usage of A2 Assistant software on Mac OS X and Windows are exactly the same. The Assistant software pages appear in other places of this manual are on the Windows for example.

1.2.2 Configure using Assistant Software on a PC

A2 flight control system can take power via the USB port during configuration, no additional battery is required. Note that the USB port can supply power no more than 500mA, an additional battery is necessary if connection failure or intermittent working.

Run the assistant software, and follow the built-in guide to carry out the configuration. Note that you may be asked to register for first time use.



1. View

Click "Info" to view user information and software version etc.

2. Restore & Upgrade


Enter "Tools" to restore default settings. And check whether the firmware is the latest.


3. Set

Enter "Basic" page. Set the Aircraft, Mounting, RC, Gain" in each tab.

4. Check

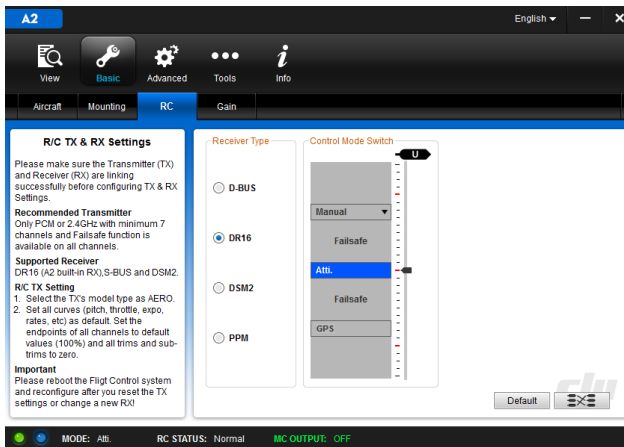
Enter "View" page to check all basic settings.

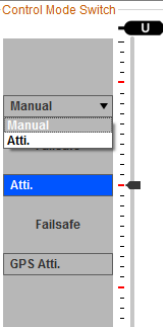
 "RC STATUS" description	Normal: the transmitter and receiver are linked and communicating well.
	Disconnect: the A2 Flight Control System is powered on, but the transmitter is powered off.
	RC-LOST: RC signal is lost (e.g. the transmitter is turned off after power on) or the receiver is sending F/S signals (e.g. the aircraft flies out of the range which transmitter is controllable).


The firmware version and the Assistant Software version should be matched when using the software to configure the A2 flight control system, otherwise the software will not work. It's recommended to keep the firmware version and Assistant Software version up to date to avoid this issues.

1.2.3 Configure the control mode switch

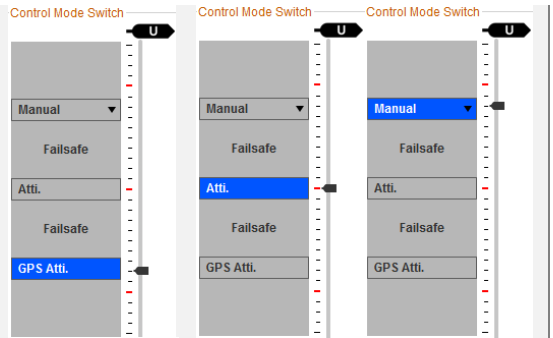
Users should configure the control mode switch in the Assistant software in the following page. Only the control mode switch has been set correctly, the control mode displayed in the left bottom corner will be the same to the control mode pointed by the cursor on the channel U.



Configuration steps	Examples
<p>Step 1.</p> <p>Power on your Transmitter, map a 3-position switch on the transmitter to the U channel of Controller Unit as the control mode switch, of which two positions are default as Atti. Mode and GPS Atti. Mode and the third position is optional, users can set as Atti. Mode or Manual Mode.</p>	

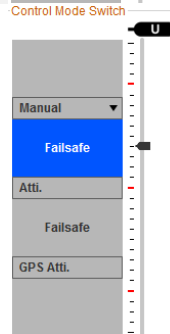
Step 2.

Toggle the control mode switch to its three positions, accordingly the cursor will move to some control mode.



Step 3.

Power off the Transmitter, the FailSafe will be enabled and the cursor will point to any area out of the control modes.

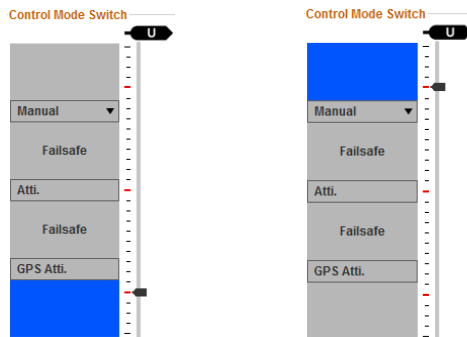


Step 4.

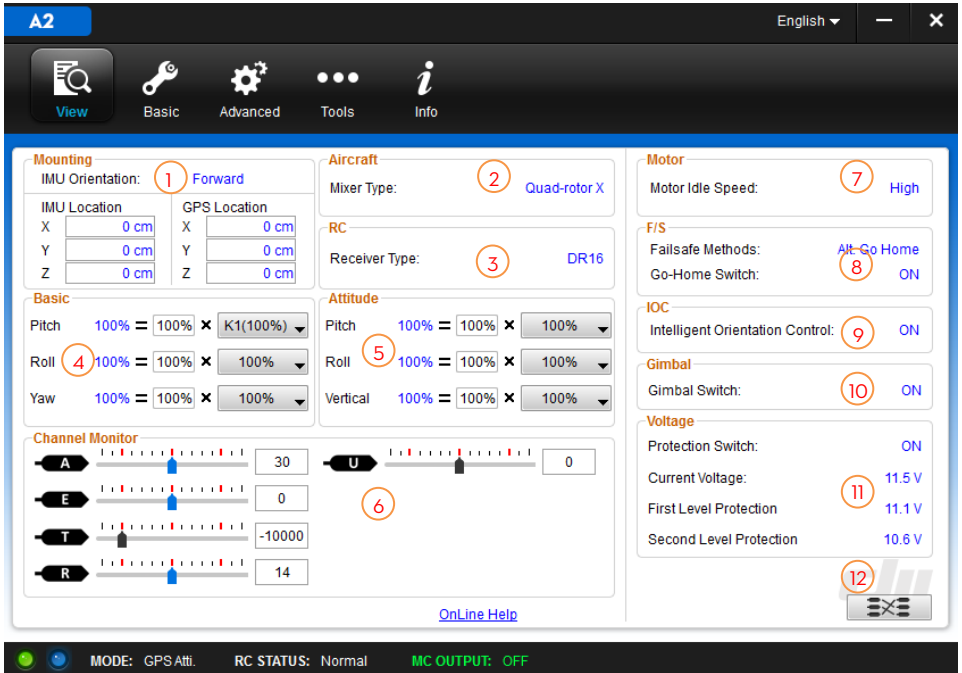
If all steps above are realized, that indicates the control mode switch is set successfully.

Important

In step 2, if the cursor doesn't point to the correct control mode area (e.g. the following figures), that indicates abnormal control mode switch configuration. Users must re-configure the Endpoint and FailSafe functions in the Transmitter to make the cursor point to the right control mode and the according areas become blue.



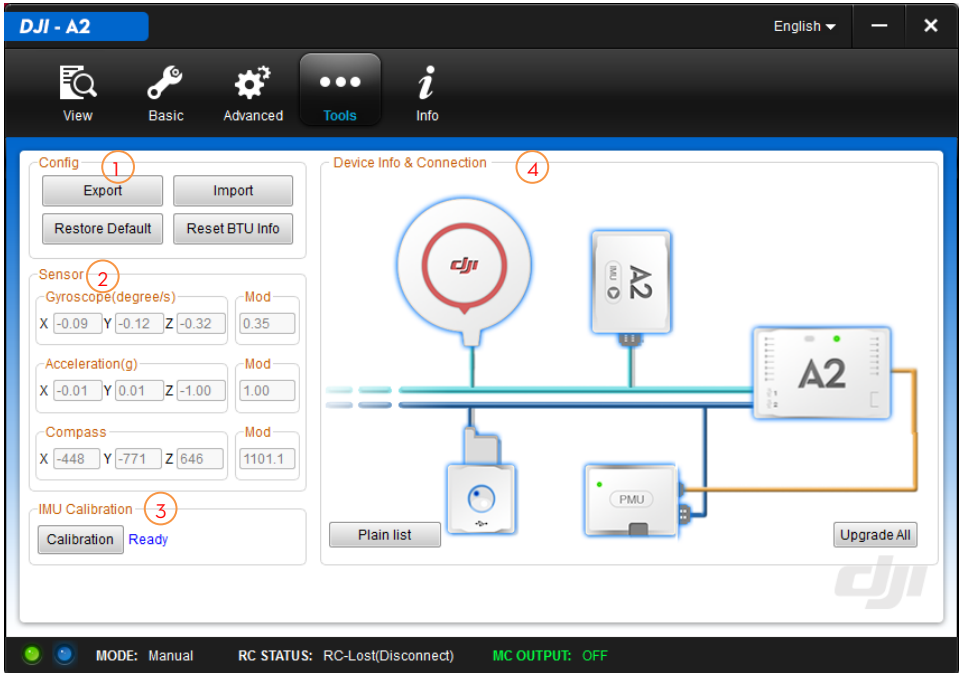
1.2.4 Configuration Checking



*Fig. above for reference only, please adhere to actual GUI.

Check List	Description
①	Check the IMU orientation direction.
②	Check the Mixer Type of aircraft. Make sure the motors are rotating normally, and propeller installation is in correct direction.
③	The Receiver type is correct.
④、⑤	Check the basic and attitude gains.
⑥	Move the sticks to test whether the cursors moves following the sticks. Toggle the “U” switch to test the control mode setting.
⑦~⑪	Advanced configuration, users can configure it according to their requirements after reading the manual.
⑫	Check the Channel Map between the Transmitter and A2 flight control system.

1.2.5 Tools



① Config

Export or import the tuning parameters and restore the default setting and reset the BTU module.

② Sensors

Read gyroscope, acceleration and compass sensor value.

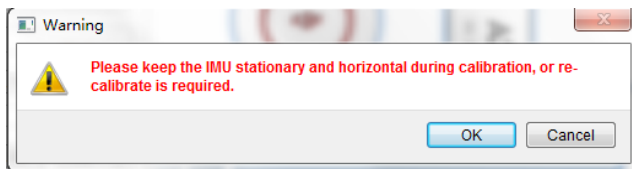
③ IMU Calibration

Calibrate IMU based on the gyroscope and acceleration sensor readings from Assistant. Calibrate is needed, when:

- Gyroscope Mod value exceeds 1.5.
- Acceleration Mod value below 0.98 or exceeds 1.02.

Steps to follow when calibrating IMU:

1. Go to IMU Calibration section after powering on A2, wait until A2 enters “Ready” status.
2. Click “Calibration”, take note of the following warning message:



Place the IMU on a stationary and horizontal surface and ensure A2 logo faces upward.

3. Click “OK” to proceed.

④ Device Information and Connection Status

All devices that connected to the A2 flight controller are highlighted, however, disconnected devices appear grey. Single click a highlighted device to upgrade its firmware. You can also upgrade all firmware by clicking the “**Upgrade All**” button.

1.3 Compass Calibration

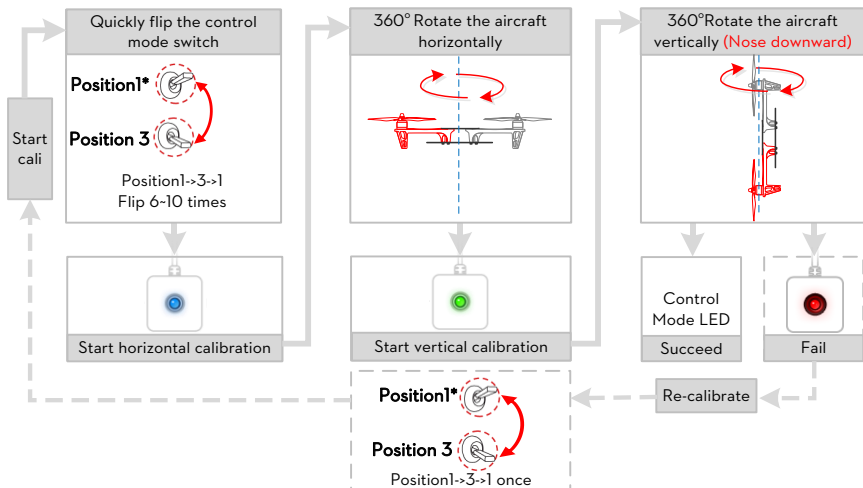
The Compass can assist the GPS to position the aircraft, which is very important during flight. As we know, the compass is very sensitive to electromagnetic interference, which will cause abnormal compass data, and lead to poor flight performance or even flight failure. **Compass Calibration MUST be done for first time use.** It is recommended to calibrate the compass outdoors after the Controller Unit finds 7 or more GPS satellites. Regular calibration enables the compass to keep optimal performance.

Calibration Cautions

- (1) DO NOT calibrate your compass where there is strong magnetic interference, such as magnetite, car park, and steel reinforcement under the ground.
- (2) DO NOT carry ferromagnetic materials with you during calibration, such as keys or cell phones.
- (3) Compass Calibration is very important; otherwise the flight control system cannot work.

Calibration Procedures

Choose an open space to carry out the following procedures.



Situations that require recalibration

Situations	Descriptions
Compass Data abnormal	LED blinks yellow and green alternatively (●●(α)).
Flying field altered	Flying field has changed over a long distance.
Mechanical alteration	The mounting position of GPS-COMPASS PRO PLUS module changes. Electronic units such as Controller Unit, CAN-HUB, battery etc. have been added, removed, remounted or other alterations. Mechanical structures of the aircraft has changed
Drifting during flying	Evident drifts occurred in flight such as the aircraft doesn't fly straight
Attitude errors	LED often blinks error indicator when the aircraft turns around.

2 Basic flying




Read this section before basic flight testing.

2.1 Control Mode Instruction

The aircraft performs differently when using different control modes. Please read the following table to know the different control modes, which may help you to achieve a more involved flight experience.

Control Mode	GPS ATTI. Mode	ATTI. Mode	Manual Mode
Command Linearity	YES		
Yaw	Control the aircraft to rotate in clockwise and counter clockwise direction. Maximum rudder angular velocity 150°/s		
Roll and Pitch	Aircraft attitude control; Mid point of stick is for 0° attitude, and its endpoint is 35°.	Max-angular velocity is 150°/s. No attitude angle limit.	
Throttle	Aircraft height control. Maintain the altitude best above 1 meter from ground when the throttle stick is in mid position.	No altitude locking when the throttle stick is in mid position.	
All Sticks Released	Lock position if GPS signal is adequate.	Only attitude stabilizing. No position locking.	Keep original attitude.
GPS Lost	Once GPS signal lost the flight control system will enter ATTI. Mode automatically. Return to GPS ATTI. Mode after GPS signal has recovered for 2 seconds.	---	---
IOC Supported	CL/HL/POI/BTM	CL	None


Assign a 3-position switch of the transmitter as the control mode switch. The position-1 is defaulted as “GPS ATTI. Mode” and the position-2 is “ATTI. Mode”. The position-3 can be set as “Manual Mode” or “ATTI. Mode” in A2 assistant software.

Control Mode Switch	 position-1	 position-2	 position-3
Configurable Control Mode	GPS ATTI. Mode	ATTI. Mode *	ATTI. Mode * Manual Mode
FailSafe Protection	The flight control system will enter FailSafe Mode if the Transmitter signal is lost and no matter if Transmitter signal recovers or not, system will not exit FailSafe mode automatically.		The flight control system will enter FailSafe Mode if the Transmitter signal is lost and the system will exit FailSafe once the signal recovers.

GPS Involved	YES		NO
Low-voltage Protection	LED alert with Descending or Go Home & Landing precautions		Only LED alert
Environment recommended	Open flying field; Good GPS signal	Narrow Space; GPS signal bad	Regain control in emergency


The difference between ATTI. Mode of position-2 and ATTI. Mode of position-3 is that they are working differently in protection situations.

2.2 Flying Environment Requirements


- (1) Before use of the product, please accept some flight training (Using a simulator to practice flying, getting instruction from a professional person, etc.).
- (2) DO NOT fly in bad weather, such as rain or wind (more than moderate breeze) or fog.
- (3) The flying field should be open without tall buildings or other obstacles; the buildings of steel structure will interfere with the compass.
-  (4) Keep the aircraft away from obstacles, crowds, power lines, trees, lakes and rivers etc.
- (5) Try to avoid interference between the remote control Transmitter and other wireless equipment. (No base station or cell tower around)
- (6) The flight control system can't work at the South Pole and the North Pole.
- (7) All parts must be kept out of the reach of children to avoid CHOKO HAZARD; if a child accidentally swallows any part you should immediately seek medical assistance.

2.3 Check List before Flying

Double check the following list, otherwise, if any one of the following items is wrong it may lead to flight accident.

- (1) All parts are in good condition, no ageing or damaged components
- (2) Motor rotating direction
- (3) Propeller mounting direction
- (4) Mixer Type set in assistant software
-  (5) IMU and GPS-COMPASS PRO PLUS mounting direction
- (6) Transmitter channel mapping and sticks movement direction correct
- (7) Compass calibration
- (8) ESC connection
- (9) IMU and GPS-COMPASS PRO PLUS firmly mounted




In addition, check the following items to make sure the system can work.

-  (1) The Transmitter battery is fully charged.
- (2) The aircraft battery is fully charged.
- (3) Do not over load the aircraft.

2.4 Power on and Check

(1) Control mode LED indicator

Power on the Transmitter then the flight control system. Toggle the control mode switch to different positions.

Control Mode LED indicator			
Control Mode Switch	 GPS ATTI. Mode	 ATTI. Mode	 Manual Mode
LED	● (Stick not in midpoint ●(2))	● (Stick not in midpoint ●(2))	No LED indicator
Set	Put the Control Mode switch to GPS position for basic flying test. Note: when the GPS signal LED indicator is bad or worst (●(2) or ●(3)) and lasts for more than 3secs, the flight control system will enter into ATTI. Mode.		

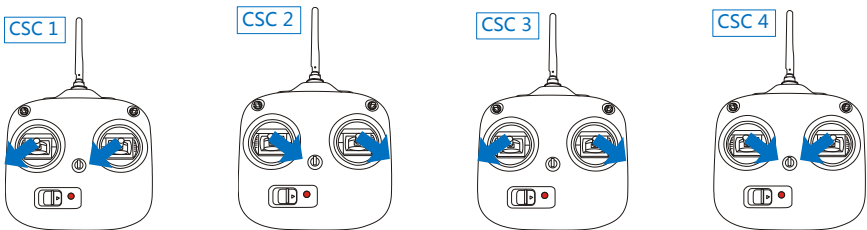
(2) GPS signal LED indicator

GPS signal indication blinks after every Control mode indication. We suggest flying when GPS satellites are more than 5.


GPS signal LED indicator			
Worst (→GPS← 5) : ●(3)	Bad (→GPS←= 5) : ●(2)	Well (→GPS← 6) : ●(1)	Best (→GPS←> 6) : No indicator

2.5 Start Motors Methods


CSC (Combination sticks commands) is used to start motors instead of just pushing the throttle stick. One of the following methods can be used to start/stop motors.



Under the conditions stated below, the motors will stop in ATTI. Mode/GPS ATTI. Mode:

- (1) The throttle sticks is under 10% for more than 3secs after motors start.
-  (2) The throttle sticks is under 10% for more than 3secs after landing.
- (3) The throttle sticks is under 10% for more than 3secs and the inclined angle of aircraft exceeds 70°.

If motors fail to start, please refer to the following list for trouble shooting.

-  (1) The Controller Unit fails to obtain the firmware version of IMU and GPS, please check the connection or upgrade the IMU and GPS.

- (2) The firmware version of IMU and Controller Unit is mismatched; please upgrade the firmware of IMU or Controller Unit.
- (3) The firmware version of GPS and Controller Unit is mismatched; please upgrade the firmware of GPS or Controller Unit.
- (4) The transmitter calibration has exited abnormally, please recalibrate.
- (5) The transmitter calibration results with big bias, please recalibrate.
- (6) The transmitter calibration results with big mid point bias, please recalibrate.
- (7) Incorrect channel mappings, please make sure the basic channels A/E/T/R/U are mapped correctly.
- (8) Invalid SN or SN error; please contact your dealer or DJI custom service.
- (9) The Controller Unit is locked, please unlock the Controller Unit and reconfigure all the parameters in the Assistant software.
- (10) IMU disconnected, please check the connection.
- (11) Compass data abnormal, please eliminate magnetic interference and recalibrate the compass.
- (12) When Flight limit function is enabled, if the aircraft fly out of the max-radius in ATTI. mode and the motors are stalling, the motors will fail to spool up in GPS ATTI. mode cause the Flight limit function works.
- (13) The attitude status is bad and the LED indicator blinks white, the motors will fail to spool up.
- (14) The Transmitter disconnected, the motors will fail to spool up.
- (15) The A2 flight control system is connecting and communicating with the Assistant software, the motors will fail to spool up.

2.6 Basic Flying Test

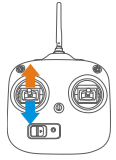
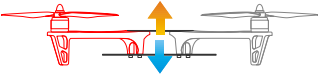
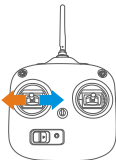
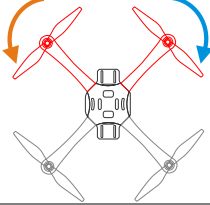
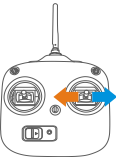
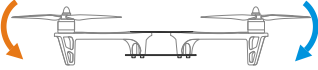
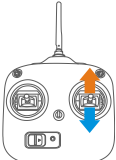
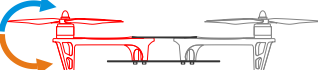
Carry out the following procedures to complete the basic flight test.

1. Wait the GPS signal to be well	LED
Place the aircraft away from you and others at least 3 meters and wait the $+GPS \geq 6$ (about 30 seconds).	● or no Red LED



2. Start motors and takeoff aircraft.	LED
Execute CSC to start motors; all sticks back to midpoint as soon as motors start, then push the throttle stick to take off the aircraft, meanwhile the home point is recorded. NOTE: 36secs after power on; 10secs after $+GPS \geq 6$; Motors have been started, auto-record the position as home point at the first time the throttle stick is raised	● (α)
After the home point is recorded successfully and the distance from aircraft is less than 8m, LED indicator will blink 6 violet continually. Note: only when GPS signal is good (no Red LED) LED indicator will blink 6 violet continually.	● (6)



3. Operate sticks to control the flying attitude of the aircraft during flight		
Transmitter (Mode2)	Aircraft	Operations
Throttle Stick 		Push Throttle sticks to control the aircraft to elevate and descend. The aircraft can lock to an altitude when the throttle stick is at midpoint.
Yaw Stick 		Push the yaw stick to rotate the aircraft in clockwise or counter clockwise direction.
Roll Stick 		Push roll stick to control the aircraft left or right, pitch stick to control forward or backward.
Pitch Stick 		When both roll and pitch sticks are at midpoint : (1) GPS ATTI. Mode: the aircraft will be stabilized and locked in horizontal position. (2) ATTI. Mode: the aircraft will be stabilized but unlocked in horizontal position.



4.Hover

In GPS ATTI. Mode , the aircraft will hover when the throttle/yaw/roll/pitch sticks are all released at mid-point.



5.Landing

Use the throttle stick to control the landing speed, try to land your aircraft gently to avoid shock or crash.

Please refer to the next section “Protection Functions Setting” to take precautions.



- (1) Low voltage alert: yellow quick flashes or red quick flashes.
- (2) FailSafe: LED indicator blinks blue.

Moreover, you may come across the following abnormal situation, please carry out the operation below.









- (3) Compass data is abnormal; the LED blinks yellow and green alternatively. Please re-calibrate the Compass.
- (4) IMU data is abnormal, the LED blinks four green. Please contact your dealer.

3 Protection Functions Setting

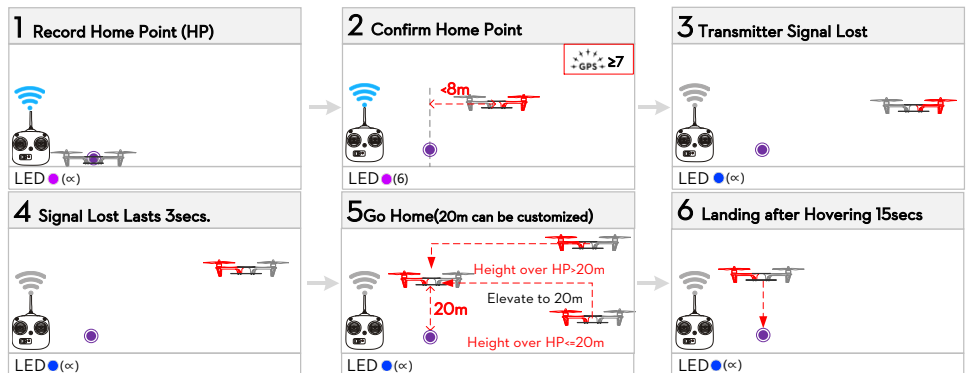
Set protection in the Assistant software ->Advanced page. FailSafe and Low voltage protections are required.

3.1 FailSafe

FailSafe works when the Transmitter (TX) signal is lost, the flight control system will automatically control the aircraft to reduce injuries or damage.

	TX signal		Descriptions
Home Point (HP)			<p>Home point will be recorded:</p> <ul style="list-style-type: none"> - After 30 seconds of strong GPS signal - 10 seconds later after green LEDs have stopped blinking, when throttle sticks are moved away from mid point.
FailSafe			<p>Customize the failsafe to define what happens if remote control signal is lost. Choose from either auto hovering, RTH or "RTH at a preset altitude in the A2 Assistant"</p>
One-Key Go Home		6	<p>A switch can be set to trigger RTH without signal loss. If One-Key RTH is enabled during flight, aircraft control will cease and LED lights will indicate Control Mode. Release the RTH switch to regain control. If the Failsafe has been triggered the switch will not work.</p> <p>With One-Key RTH in progress, aircraft orientation can be controlled while the aircraft returns.</p>

FailSafe and Go Home procedures






- (1) The aircraft will not go home (only attitude stabilizing) in the condition that $\text{GPS} < 6$ or GPS is not working, even if Transmitter signal is lost or Go Home switch is triggered.
- (2) It is recommended to set the Go Home switch in the Assistant software. Users are suggested to

enter FailSafe and go home by using the Go Home switch rather than turning off the Transmitter in emergency situations.

- (3) Make sure there are no obstacles during aircraft go home and users are familiar with the methods to regain control.





How to regain control in FailSafe

3-position Switch	 Position-1	 Position-2	 Position-3	
	GPS ATTI. Mode	ATTI. Mode	ATTI. Mode	Manual Mode
Regain control	You have to toggle the control mode switch once to regain control if the signal recovers.		Regain control as soon as signal recovers.	


3.2 Low Voltage Protection

Low voltage protection is used to alert low battery voltage during flight; in this case, users should promptly fly back the aircraft and land to avoid unexpected damages.

To use this function please set in **Assistant software->Advanced->Voltage** page to configure two voltage levels.

Protections	Option Selected	Conditions	LED	Aircraft
	First level	LED	----	None
		GH & Landing	Make sure the home point is recorded and no obstacles in going home and landing path.	 (∞)
	Second level	LED	----	None
		Descending	----	 (∞)

Go-Home & Landing Usage Tips

- (1) The home point recorded is the same in both FailSafe and Low voltage protection. The aircraft will not go home in the following cases :
 - a) Control mode switch is at the position-3 (Manual Mode or ATTI. Mode)
 - b) GPS signal is bad ()
 - c) The distance between aircraft and the home point is less than 25m, and the height over the Home point less than 20m.

Descending Usage Tips

The aircraft will not hover when the throttle stick is at the mid point. Push the throttle stick to 90% of its endpoint, the aircraft will still ascend slowly if you continue to pull the throttle stick, and the control of Pitch, Roll and Yaw are the same as before.

- (1) Please pay attention to the LED alert of low voltage and make sure the power is enough for go home and landing. Insufficient power reserve will cause the aircraft to crash as well as other consequences.




- (2) If the second level low voltage alert occurs in below procedures, the aircraft will descend automatically.
 - a) When the aircraft is in FailSafe and Go Home process.
 - b) When the aircraft is controlled by the Ground Station.

4 Advanced Features




The advanced features of A2 include IOC (intelligent orientation control), gimbal control, parachute activation and so on. It also enable users to tweak the A2 configuration via the A2 Assistant wirelessly through the Bluetooth connection.

4.1 IOC (Intelligent Orientation Control) function

4.1.1 IOC

	IOC	Help users to set the Flying direction; Should be enabled in Assistant software.
	Flying direction	The flying direction of aircraft when pushing the Roll and Pitch sticks.
	Forward direction	The flying direction of aircraft when the pitch stick is pushed forward.
	Normal flying	IOC is disabled. Forward direction is pointing to the nose direction and changes along with the nose.
	CL(course lock) mode	Its forward direction is pointing to the nose direction when recording, which is fixed until you re-record it or exit from CL.
	HL (home lock) mode	Record a Home Point (HP), push Pitch stick to control the aircraft far from or near to the HP.
	POI mode	Point of Interest. Record a point of interest (POI), the aircraft can circle around the POI, and the nose always points to the POI.
	BTM (Banked Turn) mode	In this mode, the roll and yaw sticks are combined to help you perform banked turns with only one hand.

Conditions of IOC function




Flying	IOC Setting	Control Mode	GPS-COMPASS PRO PLUS Required	GPS Satellites	Distance Limits
Normal	----	----	----	Basic to control mode	None
CL	Enabled	Not Manual Mode	Compass	None	None
HL	Enabled	GPS ATTI. Mode	GPS		Aircraft ← $\geq 10m$ → HP
POI	Enabled	GPS ATTI. Mode	GPS		Aircraft ← $5m-500m$ → POI
BTM	Enabled	GPS ATTI. Mode	GPS		None

Step 1 IOC switch setting

Please enable the IOC function in **Advanced**→**IOC** page of Assistant software. Then choose a 3-position switch on the Transmitter to set as IOC switch, which is used to select the different IOC modes and manually record the



Forward direction, HP and POI recording.


There are six types of IOC switch setting. Below are the three recommended options of IOC switch setting which may be configured in the Assistant software.

Switch positions		A	B	C
1		OFF	OFF	OFF
2		CL	CL	CL
3		HL	POI	BTM

Step 2 Forward Direction, HP and POI Recording

After you enable the IOC in assistant software, the flight control system will record the forward direction and home point automatically after power on, if the recording conditions are met. You can manually re-record the forward direction, home point and POI during flying. Note that no BTM recording is required. Read the following table for the recording method details.

	CL	HL	POI												
Recorded Orientation	Aircraft 's nose as forward direction	Home point	The position that the user wish to fly around.												
Conditions	36 secs after power on	10secs later after $\uparrow\uparrow\uparrow\uparrow\uparrow\uparrow \geq 6$; Motors have been started.	10secs later after $\uparrow\uparrow\uparrow\uparrow\uparrow\uparrow \geq 6$.												
Automatically	Automatically record at 36 secs after power on	Automatically record at the first time you push the throttle stick	No Automatic record method												
Manual	According to any option of IOC switch setting, quickly toggle the switch between adjacent positions 3-5 times to record manually.														
	 <table border="1" style="display: inline-table; margin-left: 10px;"> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> <tr> <td>Forward direction</td> <td>Forward direction</td> <td>Forward direction</td> </tr> </table>	A	B	C	Forward direction	Forward direction	Forward direction	 <table border="1" style="display: inline-table; margin-left: 10px;"> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> <tr> <td>HP</td> <td>POI</td> <td>None</td> </tr> </table>	A	B	C	HP	POI	None	
A	B	C													
Forward direction	Forward direction	Forward direction													
A	B	C													
HP	POI	None													
Successful	● (20)	● (20)	● (20)												

- (1) DO NOT toggle the switch between the position 1 and 3 frequently, which may re-record the position 2.
- (2) The new Home Point and Forward Direction can be set only after one has already been recorded automatically.
-  (3) HP is not only used in IOC, but also in FailSafe and Low voltage as go home and landing destination. The flight control system will automatically record the HP even if IOC function is disabled in Assistant software but Forward direction and POI can be recorded only after IOC is enabled.

(4) Once the Home Point is recorded successfully, LED will blink (6) continually under the following conditions. All conditions must be true.

1. ≥ 6 .
2. Distance between aircraft and the recorded home point is less than 8m.
3. Current control mode is in GPS ATTI. Mode or ATTI. Mode of switch position-2.

Step 3 CL, HL and POI flying test

Please study the following diagram then make an IOC flying test. IOC LED indicator blinks (2) means not all stick(s) at the midpoint)


			Pitch stick control of aircraft		Roll stick control of aircraft	
Flying	IOC switch	Record				
Normal	OFF	None				
CL	CL					
HL	HL					
POI	POI					

DO NOT toggle the IOC switch frequently in HL flying to avoid re-recording the HP unwittingly.

IOC function is available only when all the required conditions are satisfied. If any condition is omitted the flight control system will exit IOC. Please keep an eye on the LED to know the current control mode.

(1) It is recommended to start the HL flight when the aircraft is $>10\text{m}$ away from the HP. If starting the HL when the distance between aircraft and HP is less than 10m and it's the first time you start HL after power on, then the flight control system will only enter HL after flying out of the

10m range.

- (2) During HL flying if one of the following conditions occur, the flight control system will exit HL and enter into CL: the aircraft is within of 10m from HP; the control mode is changed to ATTI. Mode;  <6(LED ●(2) or ●(3)).

Step 4 Banked Turn mode flying test

Banked Turn Mode is useful when you want to perform banked turns one handed. It allows you to pitch and roll to turn without using the yaw stick.

Application examples:

1. Normal and FPV aerial photography in this mode is smooth and simple, giving a different visual feel to your work.
2. In this mode, the roll and yaw sticks are combined to help you perform banked turns with only one hand.

Setting steps (Mode 2):

1. To enable Banked Turn Mode, replace the POI gear of the IOC switch with Banked Turn gear.
2. With Banked Turn Mode activated, you can circle the aircraft with just one stick. To do this, Mode 2 (throttle on the left stick) users should select the “Use Roll” option while Mode 1 (throttle on the right stick) users should select the “Use Yaw” option.

DJI - A2 English — X

View Basic **Advanced** Tools Info

Motor F/S **IOC** Gimbal Voltage Limits Gear Parachute

Intelligent Orientation Control (IOC)

Intelligent Orientation Control

OFF Course Lock Fixed Wing

IOC

Banked Turn(Mode)

Use Roll Use Yaw Drift Damping: 100

Cruise Control(CC)

OFF Set Continuous

Cruise Speed

Default

IOC Setting Procedure

1. Tick the CheckBox to enable the IOC.
2. Select the desired options in drop-down lists.
3. Choose a 3-position switch on your TX as IOC switch and click “Channel Map” button to map the switch to a channel on Receiver. IOC switch is used for recording and IOC function options.
4. Toggle the IOC switch to move the cursor and the cursor pointed area should turn blue.









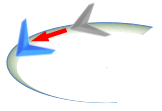
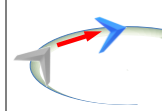
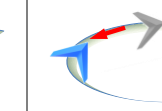
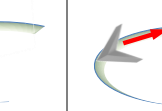
Tips


1. Adjust the end-point of IOC switch on your Transmitter if the cursor pointed area does not turn blue.
2. Please refer to the manual to learn more about IOC before using IOC functions.

MODE: Manual RC STATUS: RC-Lost(Disconnect) MC OUTPUT: OFF

Using Banked Turn Mode (Mode 2):

1. Select "Use Roll" to disable the yaw stick or select "Use Yaw" to disable the roll stick.
2. Push pitch stick to move the aircraft forward or backward.
3. After that, Push roll stick left or right to perform banked turn as the following diagram shown. No yaw stick required.
4. When the aircraft is hovering, yaw is controlled by the roll stick instead.
5. Rapidly pull the pitch stick to the mid-point to stop the aircraft.

Flying	IOC switch	Record	Pitch stick	Roll stick	Pitch stick	Roll stick	Pitch stick	Roll stick	Pitch stick	Roll stick
										
BTM	BTM	None								

	<p>(1) Banked Turn Mode works only with GPS-ATTI mode (GPS ≥ 6). The aircraft will stop and hover when less than 6 satellites are found.</p> <p>(2) Once the aircraft performs side slip, adjust the drift damping value. Note that too big value may lead to aircraft vibration.</p>
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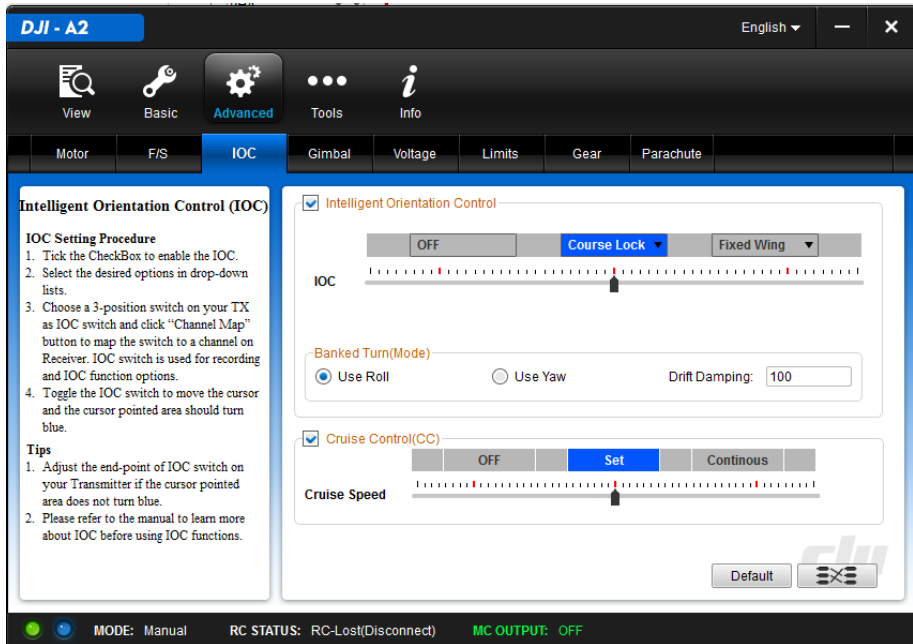
4.1.2 Cruise Control

Cruise Control allows you to lock the speed of the aircraft, freeing you to control the gimbal while maintaining flight.

Application examples:

1. By maintaining steady flight, you can focus more on your shots and gimbal control, and your total flight time is increased by eliminating unnecessary speed changes.
2. Activate Cruise Control to lock your aircraft into its current horizontal speed when you release the control sticks.


Cruise Control only works when IOC has been enabled. Tick the Cruise Control box in the A2 Assistant to enable it.



Assign a 3-gear switch on the remote control for Cruise Control. Follow the steps below to use Cruise Control. Use the control sticks to accelerate the aircraft to your target speed then toggle the assigned Cruise Control switch to “Set” or “Continues”.

The action of three different gears of the cruise speed is defined as follow:

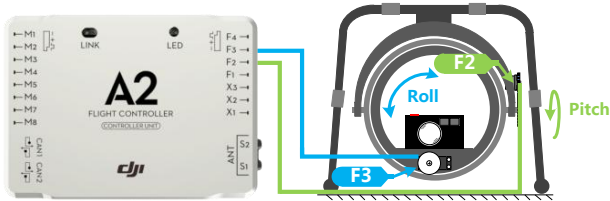
- **Close**
Deactivate Cruise Control.
- **Set**
Move the switch to this position in flight to “Set” the cruising speed. The speed at the point that the switch is toggled will be maintained. If you use the control sticks to adjust aircraft speed, the aircraft will return to its original speed once the control sticks return to center.
- **Continues**
In this position the aircraft will maintain its speed of flight however if you accelerate or slow down, it will continue flying at the new speed once the control sticks return to center.

	<ol style="list-style-type: none"> (1) Cruise Control only works in GPS-ATTI mode (GPS > 6). (2) The aircraft will exit Cruise Control mode and hover at its current altitude when less than 6 GPS satellites are detected, switches to ATTI. mode or enters auto go home mode. To enter “Set” and “Continue” modes, you must first go into “OFF” mode. (3) Cruise Control is disabled during Banked Turn mode flying. (4) Maximum speed is 15m/s under Cruise Control mode.
--	---

4.2 Servo Gimbal function

Connect the servos of your gimbal to the Controller Unit as the fig. below , roll servo connects to F3 port and pitch servo connects to F2, and configure in **Advanced->Gimbal** page in the Assistant software. No Receiver channel is asked to be mapped for the F2 or F3 port if gimbal function is enabled in the Assistant Software.

Note: Even you map Receiver channels to F3 and F2 (Which are shown as D3 and D2 in the Assistant Software -> Channel Mapping), the F3 and F2 will not give output signals from the mapped Receiver channels.



4.3 Flight Limits

All unmanned aerial vehicle (UAV) operators should abide by all regulations from such organizations as the ICAO (International Civil Aviation Organization) and their own national airspace regulations. For safety reasons, the flight limits function is enabled by default to help users use this product safely and legally. The flight limits function includes height, distance limits and safety zone.

In Ready to Fly mode, height, distance limits and No Fly Zones work together to manage flight. In Ready to Fly (non-GPS) status, only height limits applies and flights cannot go higher than 120m.

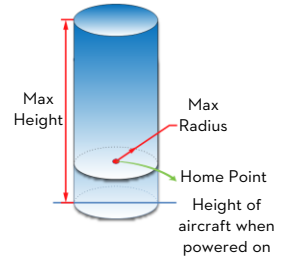
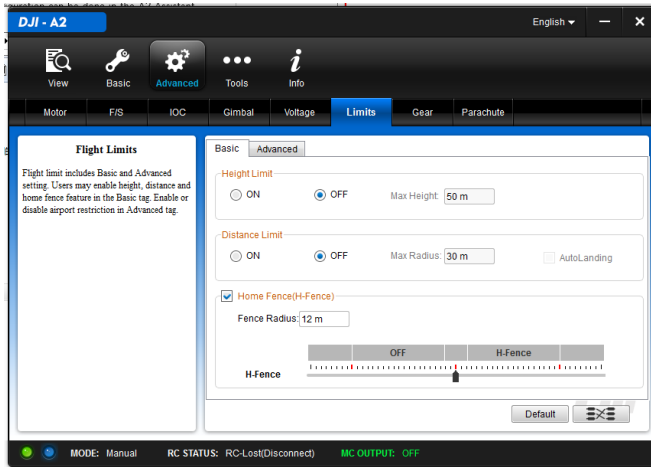
Default parameters in Assistant Software are compliant within the definitions of class G ruled by ICAO.



(Refer to [Airspace Classification](#) to get more details). As each country has its own rules, make sure to configure these parameters to comply with these rules before flying.


4.3.1 Max Height, Radius Limits & Home Fence

The Max Height & Radius restricts the flying height and distance. Configuration can be done in the A2 Assistant. Once complete, your aircraft will fly in a restricted cylinder.



GPS ATTI mode		
	Limits	Ground Station Tips
Max Height	Flight height must be under the set height.	Warning: Height limit reached.
Max Radius	Flight distance must be within the max radius.	Warning: Distance limit reached.

ATTI mode		
	Flight Limits	Ground Station Tips
Max Height	Flight height restricted to 120m and under.	Warning: Height limit reached.
Max Radius	No limits	

-  (1) If you fly out of the limit, you can still control the aircraft, but cannot fly it further.

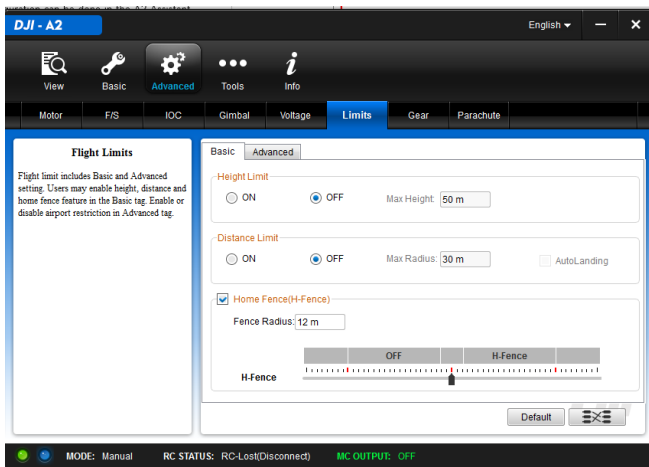
(2) If the aircraft flies out of the max radius in ATTI mode, it will fly back within range automatically.

Home fence is a safety feature that prevents the aircraft from coming in too close to an operator. When enabled, the aircraft will not be able to enter a safe area defined by the user.

Application examples:

1. Supply safe guard for new users in case of damage from wrong operation.
2. Keep users safe when aircraft flies close in a high speed.

The safety radius can be set in the A2 Assistant as shown below:



Assign a switch on the remote control to turn the home fence feature on and off. The safety radius range can be set between 12m and 100m.

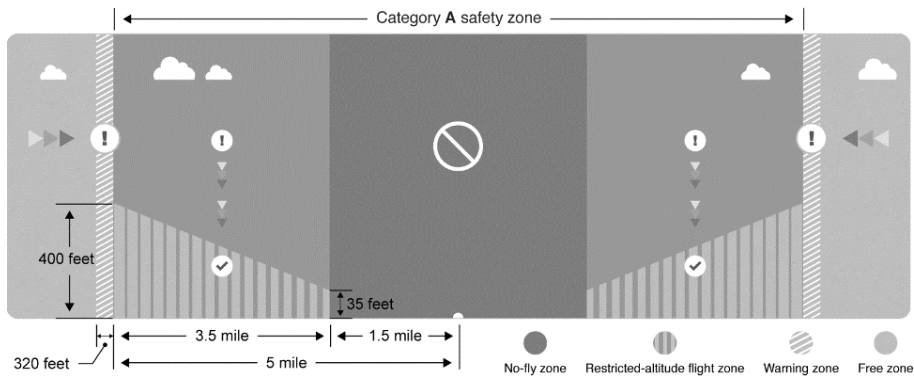
- ⚠ (1) Home fence feature works only with GPS-ATTI mode. NO home fence limit for ATTI mode and navigation mode.
- (2) Failsafe procedure overrides the home fencing feature.

4.3.2 Flight Limits of Special Areas

Restricted areas include airports worldwide. All restricted areas are listed on the DJI official website at <http://www.dji.com/fly-safe/category-mc>. Restricted areas are divided into category A and category B. Category A areas cover major international airport such as LAX and Heathrow, while category B areas includes smaller airports.

Category A Safety Zone

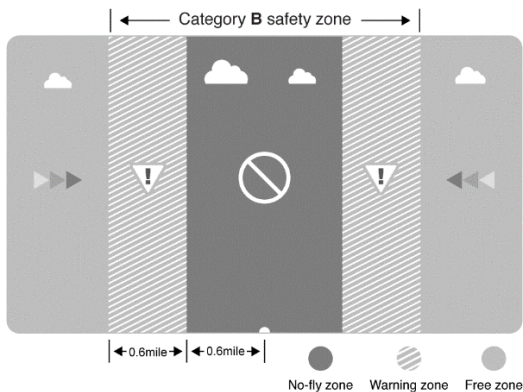
- The category A “safety zone” is comprised of a small “no-fly zone” and a range of “restricted-altitude zones”.
Flight is prevented in the “no-fly zone” but can continue with height restrictions in the restricted-altitude zone.
- 1.5 miles (2.4 km) around a designated safety zone is a no-fly zone, inside which takeoff is prevented.
- 1.5 miles (2.4 km) to 5 miles (8 km) around restricted areas are altitude restricted, with maximum altitude going from 35 feet (10.5 m) at 1.5 miles (2.4 km) to 400 feet (120 m) at 5 miles (8 km).
- A “warning zone” has been set around the safety zone. When you fly within 320 feet (100m) of the safety zone, a warning message will appear on the DJI Ground Station.




Category A




Category B Safety Zone

- Category B “safety zone” is comprised of a “no-fly zone” and a “warning zone”.
- 0.6 miles (1 km) around the safety zone is a designated “no-fly zone”.
- A “warning zone” has been set around the safety zone. When you fly within 0.6 miles (1km) of this zone, a warning will appear on the DJI Ground Station.



Category B

GPS ATTI mode		
Zone	Restriction	Rear LED Flight Indicator
No-fly Zone 	Motors will not start. If the aircraft enters the restricted area in ATTI mode but GPS ATTI mode activates, the aircraft will automatically descend to land then stop its motors after landing.	Blink red quickly and continue for 3 seconds before normal blinks.

Restricted-altitude flight zone 	If the aircraft enters a restricted area in ATTI mode and GPS ATTI mode activates, it will descend to a safe altitude and hover 15 feet below the safe altitude.	Blink yellow quickly and continue for 3 seconds before normal blinks.
Warning zone 	No flight restriction applies, but there will be warning message.	
Free zone 	No restrictions.	None.



Semi-automatic descent: All stick commands are available except the throttle stick command during the descent and landing process. Motors will stop automatically after landing. Users must toggle the S1 switch to regain control. This is the same as regaining control during Failsafe. Please refer to regain control during failsafe procedure.



- (1) When flying in the No-fly Zone, LED flight indicators will blink red quickly and continue for 3 seconds, then switch to indicate current flying status and continue for 5 seconds at which point it will switch back to red blinking.
- (2) When flying in the Restricted-altitude flight zone and Warning zone, LED flight indicators will blink yellow quickly and continue for 3 seconds, then switch to indicate current flying status and continue for 5 seconds at which point it will switch back to red blinking.
- (3) For safety reasons, please do not fly close to airports, highways, railway stations, railway lines, city centers and other special areas. Try to ensure the aircraft is visible.

4.3.3 Conditions of Flight Limits

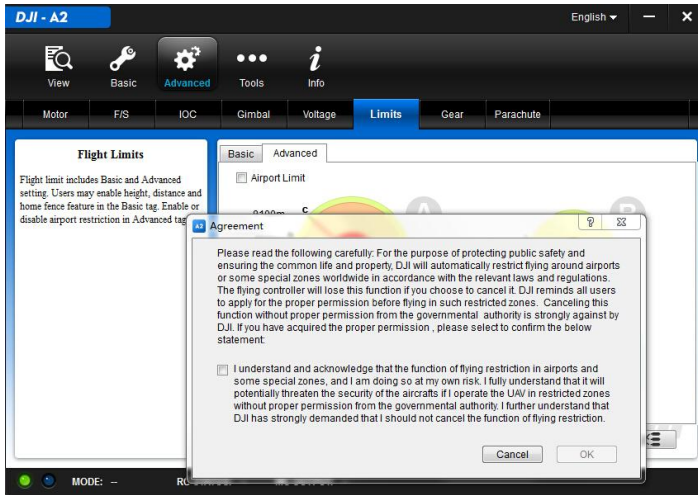
In different working modes and flight modes, flight limits will differ according to number of GPS satellites found. The following table demonstrates all the cases(√: available; ×:unavailable).

All flights are restricted by height, distance and special areas simultaneously. The Failsafe and Ground Station operations are not restricted to flight limits, but if Ground Station function is used, the flight will be restricted the special area limits built in to Ground Station. Refer to the Ground Station manual for details.

Control Mode	number of GPS found	Limits of Special Area	Max Height	Max Radius
GPS	≥6	√	√	√
	< 6	×	√	×
ATTI.	≥6	√	√	×

	< 6	x	√	x
Manual	≥ 6	x	x	x

Flight Limits can be disabled in the Assistant as below.



Users cannot take off the aircraft in some Special Areas even the Flight Limits is disabled in the Assistant.

4.4 Parachute Function

The A2 now supports the DJI Dropsafe parachute system which can be enabled in the A2 Assistant. The X3 and F4 ports should be connected. There are two methods to deploy the parachute.

1. Motors will automatically stop and the parachute will deploy by using switch on the remote control.
2. In the event of an emergency (aircraft descends faster than 10 m/s), motors will automatically stop and the parachute will deploy.



- (1) Parachute will deploy once the aircraft descends faster than 10 m/s in manual mode.
- (2) Once parachute function enabled, motors will automatically stop and the parachute will deploy.
- (3) Refer to DJI Dropsafe user manual for more details.

4.5 Gear function

Once enable the Intelligent Gear function, the gear is default down on the ground or in case of emergency (e.g. motor failure tolerance, auto landing); you can control it to be up or down by a switch when the aircraft altitude

is above 5m during flight.

Please configure in the **Advanced->Gear** page in the Assistant software. Connect the landing gear of S800 EVO to the Controller Unit as fig. below.

- (1) Make sure to enable and configure the Intelligent Gear function in the Assistant software first, and then connect the gear to the F1 port.
- (2) The Gear channel is required to be mapped with a channel on Receiver if the Intelligent Gear function is enabled in Assistant Software, and the F1 port will give outputs for retracting control.
- (3) Once you map the Gear channel, F1 port will give output signals from the controller for retract control. Otherwise, even the Intelligent Gear function is enabled; F1 will give output from DI (it's necessary to map the DI channel with a channel on Receiver as your demands).



4.6 Attitude Control When One Motor Output Fails

For Hexa-rotor, including Hexa-rotor I, Hexa-rotor V, Hexa-rotor IY and Hexa-rotor Y, the aircraft with A2 flight control system is attitude controllable when one motor output fails.



Select Course lock or home lock mode for flying the aircraft into a safe area to land when the aircraft is far away or the attitude can't be recognized.

4.7 DJI Assistant App Usage

There is a built-in Bluetooth in the A2 LED-BT-I module. With a DJI Assistant App installed on your mobile device, remote parameter configuration can be obtained via Bluetooth communication between the A2 Flight Control System and the mobile device.

Bluetooth status indicator	
■	Normal
●●●●	Communicating
■	Abnormal



Antenna of Bluetooth

Supported iOS devices

iPhone 4s, iPhone 5, iPhone 5s, iPod Touch 5, iPad 3, iPad 4, iPad air, iPad mini,
iOS6.1 or above is required. Bluetooth version is required to be 4.0 or above.

Required versions of DJI Assistant App & Firmware

Require DJI Assistant App version 1.1.14 or above and the firmware of A2 Controller Unit version 2.1 or above, as well as the firmware of LED-BT-I module version 2.0 or above.

Specifications









Bluetooth version	4.0	Environment temperature	-10°C~+50°C
Communication distance	50m	Consumption	240mw(0.04A@6V)

DJI Assistant App Usage

Step 1 Download and installation

1. Search the **DJI Assistant** in App store on mobile device and install it.

Step 2 Connect the A2 Controller Unit and the DJI Assistant App


1. Prepare an iOS device supported 4.0 Bluetooth, and then enable the Bluetooth function on the mobile device.
2. Power on the transmitter and the A2 Flight Control System, make sure the Bluetooth Status Indicator is solid Red .
3. Run the DJI Assistant App. You may be asked to register through internet when first login (the account of PC Assistant software is OK for login); follow the tips to set Main Controller name and password.
4. Observe the indicators   on the left bottom of the software. ( connection indicator and  communication indicator) On the DJI Assistant App, if the communication indicator is , please double check the connections and driver installation; otherwise if the indicator is blinking , go to next step.
5. Select the "Basic" option. Please follow step-by-step for your first-time-configuration. Basic configuration is necessary. Click the icon  to get the configuration details.
6. You can click the "Advanced" option for more parameter settings. Advanced setting is optional. There are Motor, F/S, IOC, Gimbal, Voltage, Limits, Gear, etc.
7. Check all parameters in the View page.
8. Select "More" to obtain more details. Including: Restore MC default settings, Accounts, Main Controller List, Information, wiki, Rate DJI Assistant, FAQ, Feedback, About.



1. Make sure to upgrade the LED-BT-I module to the latest firmware via the PC Assistant software on a PC before you use the DJI Assistant App with the A2 Flight Control System.

2. Every time you run the DJI Assistant App, the App will search the Controller Unit automatically.
3. The gain value displayed on Mobile Device and PC may be a little different, that is OK for use.

Step 3 Flying Test Procedures

1. Get the aircraft ready, run the DJI Assistant and make sure it is connected with the main controller. (The indicators on the DJI Assistant are )
2. Start the motors.
3. The “View” page shows the relative parameters real-time when flying.
4. Go to the “Basic” and click into the “Gain” page to set the values of all gains real-time during flying.
5. Go to the “Basic” and click into the “Tool” page to view the values of IMU & Compass real-time during flying.
6. Finish the flying and land your aircraft.



Only the parameter referred above can be changed during flying. Others can be configured after landing.

Appendix

LED indicator descriptions

Control mode	GPS signal
Manual Mode: No indicator	Best (+GPS+> 6): No indicator
ATTI. Mode: ●(1) (sticks not in mid-point) ●(2)	Good (+GPS+= 6): ●(1)
GPS ATTI. Mode: ●(1) (sticks not in mid-point) ●(2)	Bad (+GPS+= 5): ●(2)
Ground Station: ●(1)	Worst (+GPS+< 5): ●(3)

Flight Attitude	
Attitude good: No indicator	Attitude status bad: ○(3)
IMU data lost, calibrate IMU needed : ●(4)	

Compass calibration	
Horizontal calibration ■(∞)	Calibration Failed ●(∞)
Vertical calibration ■(∞)	Abnormal Compass Data ●●(∞)

Low voltage alert	
First level alert ●(∞)	Second level alert ●(∞)

FailSafe mode	
During the FailSafe ●(∞)	Compass Abnormal after power on ●(∞)

Errors	
System Error ●(4)	Compass Abnormal after power on ●(∞)

IOC Recording	
Record home-point successfully	●(20)
Aircraft is in the 8m range of HP	●(6)
Record forward direction successfully	●(20)
Record a Point Of Interest successfully	●(20)

Bluetooth	
A2 Assistant is connected / disconnected to the flight control system	●●(∞)



When the LED blinks ○(3), please hover or land the aircraft and wait for the white LED to go off.

When the LED blinks ●(3), it is not recommended to fly.

When the LED blinks ●(4), please contact your dealer.

Specifications

General	
Built-In Functions	<ul style="list-style-type: none"> ● Built-in Receiver ● Multiple Control Modes ● 2-axle Gimbal Supported ● Enhanced FailSafe ● Intelligent Orientation Control ● Dynamical Systems Protection ● PC & Bluetooth Ground Station ● External Receiver Supported ● 9 Types of Supported Multi-rotor ● Other DJI Products Supported ● Low Voltage Protection ● 4 Configurable Outputs ● Sound Alarm ● Configure Parameters Via Bluetooth
Peripheral	
Supported Multi-rotor	<ul style="list-style-type: none"> ● Quad-rotor: I4, X4 ● Hexa-rotor: I6, V6, Y6, IY6 ● Octo-rotor: X8, I8, V8
Supported ESC output	400Hz refresh frequency.
Supported Transmitter for Built-in Receiver	Futaba FASST (MULT, MLT2, 7CH) Series and DJI DESST Series
External Receiver Supported	Futaba S-Bus, DSM2, PPM
Recommended Battery	2S ~ 6S LiPo
Other DJI Products Supported	Z15, iOSD Mark II, D-BUS Adapter, S1000,S900 EVO, 2.4G Data Link, H3-2D, H3-3D, DJI Dropsafe Parachute
Electrical & Mechanical	
Power Consumption	MAX 5W (Typical Value: 0.3A@12.5V)
Operating Temperature	-5°C to +60°C
Total Weight	<= 224g (overall)
Dimensions	<ul style="list-style-type: none"> ● MC: 54mm x 39mm x 14.9mm ● IMU: 41.3mm x 30.5mm x 26.3mm ● GPS-COMPASS PRO PLUS: 62 mm (diameter) x 14.3 mm ● PMU: 39.5mm x 27.6mm x 9.8mm ● LED-BTU-I : 30mm x 30mm x 7.9mm
Flight Performance (can be effected by mechanical performance and payloads)	
Hovering Accuracy (In GPS ATTI. Mode)	<ul style="list-style-type: none"> ● Vertical: 0.5m ● Horizontal: 1.5m
Maximum Wind Resistance	<8m/s (17.9mph / 28.8km/h)
Max Yaw Angular Velocity	150deg/s
Max Tilt Angle	35°
Ascent / Descent	6m/s

FAQ

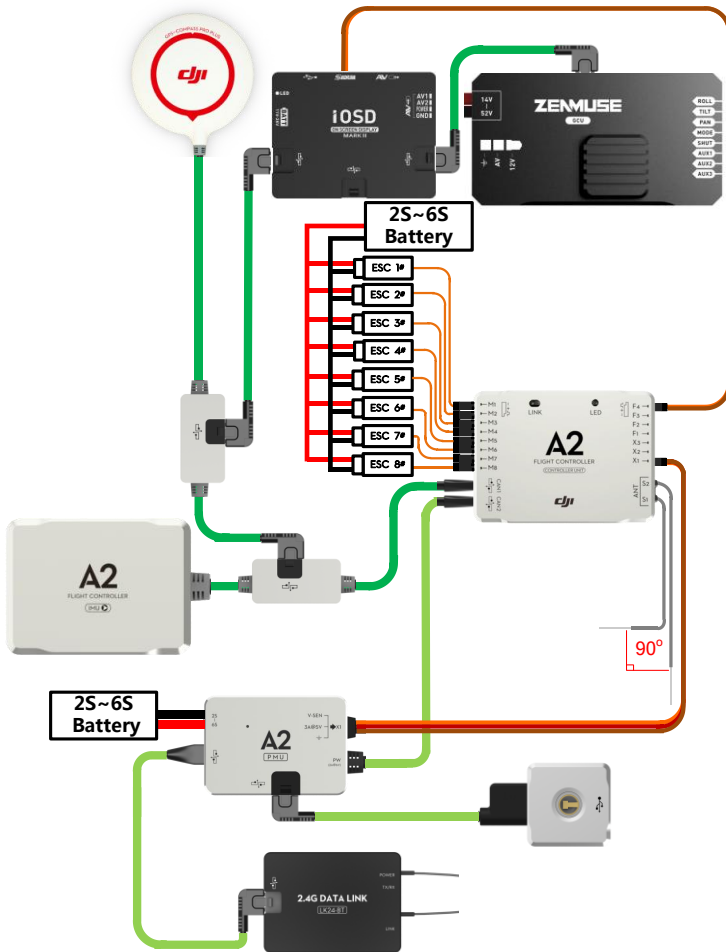
Use with other DJI products

The A2 can be used with other DJI products such as iOSD Mark II, Z15 series gimbals, S800 EVO and 2.4G Data Link(iPAD Ground Station function), H3-2D, H3-3D, etc. Users should connect them to the correct CAN-Bus port.

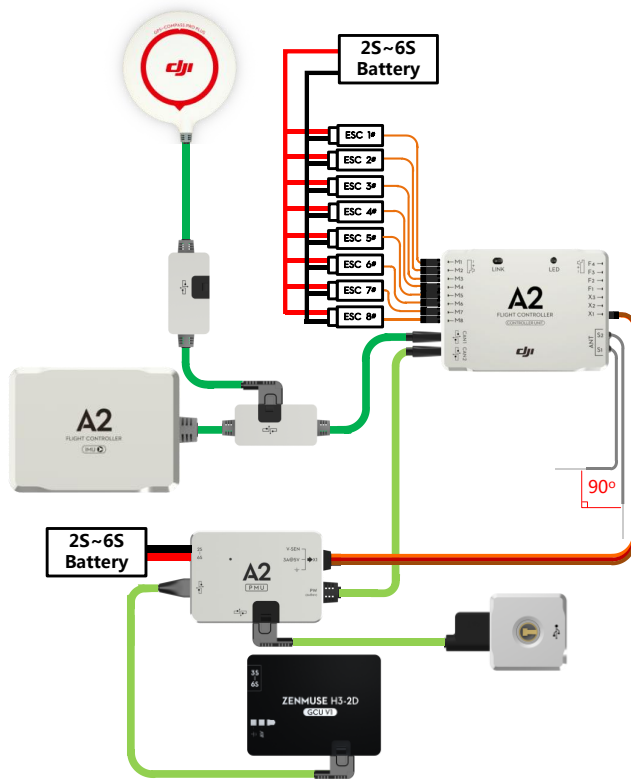
CAN1: iOSD Mark II, Z15 series.

CAN2: 2.4G Data Link (iPAD Ground Station function), H3-2D, H3-3D.

The following 2.4G Data Link connection diagram is the connection for your reference.



The following H3-2D connection diagram is the connection for your reference.



- (1) H3-2D/3D users should upgrade the firmware to the latest version (GCU V1.6& IMU V1.6 or above).
- (2) If the 2.4G Data Link and H3-2D/3D are used at the same time, a CAN-HUB module is required.


When using the A2 flight control system firmware version V2.1, the firmware of other DJI products used in conjunction must be matched with the requirements in the table below.

Other DJI Products	Firmware/Software Version (or above)	Assistant Software(use to upgrade)
iOSD Mark II	V3.0	iOSD V4.0 & OSD Viewer V4.0
Zenmuse H3-2D/3D	GCU V1.6 & IMU V1.6 & CMU1.0	H3-2D V1.02
Z15-GH3	GCU V0.12 & IMU V1.4	Z15-GH3 V1.00
Z15-5D	GCU V0.12 & IMU V1.4	Z15-5D V1.00
Z15-5N/7N/GH2/5R	GCU V0.0.12 & IMU V1.0.18_beta	Z15 V1.4
2.4G Bluetooth Datalink	The Ground end V1.0.1.5 & The Air End V1.0.1.1 & BTU V1.0.1.2	2.4G Bluetooth Datalink V1.0.0.6
iPAD Ground Station	V1.3.56	----

Channel Mapping Instructions for PC Assistant Software

The screenshot displays the channel mapping interface. On the left, under 'Basic Channels', channels A, E, T, R, and U are mapped to CH 1, CH 2, CH 3, CH 4, and CH 7 respectively. Channels K1 through K6 are currently unmapped. On the right, channels Pitch, D1, D2, D3, D4, IOc, Go Home, Gear, H3-2D, H-Fence, and CC are currently unmapped. The interface includes 'Calibration' and 'Map' buttons at the bottom left, and a 'Close' button at the bottom right.

Basic Channel	Default Settings	Usage Descriptions
A	Roll Control of the Controller Unit, mapped to the Channel 1 of Receiver	During Assistant Software usage, please click the “Calibration” button, to calibrate the Transmitter sticks travel. During calibrating, make sure to operate strictly following the prompts; otherwise may lead to calibration failure. Click the “Map” button, then you can re-do mapping for A/E/T/R/U.
E	Pitch Control of the Controller Unit, mapped to the Channel 2 of Receiver	
T	Throttle Control of the Controller Unit, mapped to the Channel 3 of Receiver	
R	Yaw Control of the Controller Unit, mapped to the Channel 4 of Receiver	
U	Control Mode Switch of the Controller Unit, mapped to the Channel 7 of Receiver	
Others	Default Settings	Usage Descriptions
K1-K6	Remote Gains Adjustment of the Controller Unit, unmapped.	Click “Unmapped” button to map K1-K6 to the channels of Receiver.
Pitch	Gimbal Pitch Control of the Controller Unit, unmapped.	Click “Unmapped” button to map Pitch to a Receiver channel for the gimbal servo control.
D1-D4	Direct Channels (The corresponding ports are F1-F4 on the Controller Unit) of	Click “Unmapped” button to map D1-D4 to the Receiver channels. If you enable the

	Controller Unit, unmapped.	Gimbal functions in Assistant Software, then the F3/F2 are used for gimbal control; even D3/D2 are mapped to channels of Receiver, and the signals from the mapped Receiver channels will be ignored. You can use F4 for switching the video channel of iOSD Mark II, then map D4 to a Receiver channel.
IOC	IOC function of the Controller Unit, unmapped.	Click “Unmapped” button to map IOC to a Receiver channel. It is recommended to use a 3-position switch channel.
Go Home	One-Key Go Home function of the Controller Unit, unmapped.	Click “Unmapped” button to map Go Home to the Receiver channel. It is recommended to use a 2-position switch channel.
Gear	Intelligent Gear function of the Controller Unit, unmapped.	If you enable the Gear function in Assistant Software, then the F1 is used for the gear control of S800 EVO landing.
H3-2D/3D	H3-2D/3D function of the Controller Unit, unmapped.	Click “Unmapped” button to map H3-2D/3D to a Receiver channel. It is recommended to use a Knob switch channel, which is only used for H3-2D/3D pitch control.
H-Fence(Home Fence)	Unmapped	Click “Unmapped” button to map Home Fence onto the Receiver channel. It is recommended to use a 2-position switch channel.
CC (Cruise Control)	Unmapped	Click “Unmapped” button to map Cruise Control to the Receiver channel. It is recommended to use a 3-position switch channel.
	The Pitch and the H3-2D/3D channels can be used at the same time. The Pitch is for the pitch control of servo gimbal, and the H3-2D/3D is for the pitch control of H3-2D/3D gimbal	

Recommended Mapping for Futaba Transmitter (Mode 2) User

Controller Unit Channel	Receiver Channel	Recommended Transmitter Switch
A	Channe 1 (AIL)	Joystick J1
E	Channe 2 (ELE)	Joystick J2
T	Channe 3 (THR)	Joystick J3
R	Channe 4 (RUD)	Joystick J4
U	Channe 7 (AUX5)	3-Position switch, e.g. SG
K1-K6	Channe 5 (GEAR)	Knob switch, e.g. LD, RD
Pitch	Channe 6 (Vpp)	Knob switch, e.g. LD, RD
D1/D3/D2	----	----
D4	Channe 9 (AUX1)	2-Position switch, e.g. SF
IOC	Channe 10 (AUX2)	3-Position switch, e.g. SG
Go Home	Channe 11 (AUX3)	2-Position switch with spring back function, e.g. SH
Gear	Channe 8 (AUX4)	2-Position switch, e.g. SF
H3-2D	Channe 12 (AUX5)	Knob switch, e.g. LD、 RD

Settings of gain values for Your Reference

To set the value of basic gain and attitude gain you can refer to the following diagram. These values are only for reference and may vary in practice.

Aircraft	Configuration Information					Basic			Attitude		
	Motor	ESC	Propeller	Battery	Weight	Pitch	Roll	Yaw	Pitch	Roll	Vertical
F450	DJI-2212	DJI-30A	DJI-8 Inch	3S-2200	890 g	150	150	135	150	150	140
F550	DJI-2212	DJI-30A	DJI-8 Inch	4S-3300	1530 g	170	170	150	160	160	150
S800 EVO/Z15	DJI-4114	DJI-40A	DJI-15Inch	6S-15000	7000g	140	140	130	140	140	130
S1000/5D gimbal/ 5D camera	DJI-4114	DJI-40A	DJI-15Inch	6S-15000	9200g	120	120	120	170	170	120
S1000/5D gimbal/ 5D camera	DJI-4114	DJI-40A	DJI-15Inch	6S-15000	9300g	120	120	120	170	170	120

The Transmitter setup of FUTABA

Please configure the Frequency item on your Transmitter adhere to the table below. (The names of FASST modes here are based to the Transmitter FUTABA T8FG, please ensure to select the most similar mode as the names differs for different Transmitters)

Transmitter type	AREA	FASST
FUTABA 18MZ	Default	FASST-MULTI\FASST-7CH
FUTABA 14MZ with TM-14	Default	MULT\7CH
FUTABA 14SG	FRANCE\GENERAL	FASST-MULTI\FASST-7CH
FUTABA 12Z 2.4G FASST with TM-14	Default	MULT\7CH
FUTABA 12FG 2.4G FASST with TM-14	Default	MULT\7CH
FUTABA 10CG or 10C with TM-10	Default	7CH
FUTABA 9C SUPER with TM-7 or TM-8	Default	7CH
FUTABA 8FG SUPER	FRANCE\GENERAL	MLT2\MULT\7CH
FUTABA 8FG	FRANCE\GENERAL	MULT/7CH
FUTABA 7C 2.4G	Default	Default
FUTABA 6EX FASST	Default	Default

Disclaimer

Please read this disclaimer carefully before using this product. By using this product, you hereby agree to this disclaimer and signify that you have read it fully.

THIS PRODUCT IS NOT SUITABLE FOR PEOPLE UNDER THE AGE OF 18.

A2 flight controller is designed for experience multi-rotor enthusiasts providing excellent self-leveling and altitude holding, which completely takes the stress out of flying RC multi-rotors for both professional and hobby applications. Despite the product having a built-in flight control system and our efforts in making the operation of the controller as safe as possible when the main power battery is connected, we strongly recommend users to remove all propellers when calibrating and setting parameters. Make sure all connections are good, and keep children and animals away during firmware upgrade, system calibration and parameter setup. DJI Innovations accepts no liability for damage(s) or injuries incurred directly or indirectly from the use of this product in the following conditions:

1. Damage(s) or injuries incurred when users are drunk, taking drugs, drug anesthesia, dizziness, fatigue, nausea and any other conditions no matter physically or mentally that could impair your ability.
2. Damage(s) or injuries caused by subjective intentional operations.
3. Any mental damage compensation caused by accident.
4. Failure to follow the guidance of the manual to assemble or operate.
5. Malfunctions caused by refit or replacement with non-DJI accessories and parts.
6. Damage(s) or injuries caused by using third party products or fake DJI products.
7. Damage(s) or injuries caused by mis-operation or subjective mis-judgment.
8. Damage(s) or injuries caused by mechanical failures due to erosion, aging.
9. Damage(s) or injuries caused by continued flying after low voltage protection alarm is triggered.
10. Damage(s) or injuries caused by knowingly flying the aircraft in abnormal condition (such as water, oil, soil, sand and other unknown material ingress into the aircraft or the assembly is not completed, the main components have obvious faults, obvious defect or missing accessories).
11. Damage(s) or injuries caused by flying in the following situations such as the aircraft in magnetic interference area, radio interference area, government regulated no-fly zones or the pilot is in backlight, blocked, fuzzy sight, and poor eyesight is not suitable for operating and other conditions not suitable for operating.
12. Damage(s) or injuries caused by using in bad weather, such as a rainy day or windy (more than moderate breeze), snow, hail, lightning, tornadoes, hurricanes etc.
13. Damage(s) or injuries caused when the aircraft is in the following situations: collision, fire, explosion, floods, tsunamis, subsidence, ice trapped, avalanche, debris flow, landslide, earthquake, etc.
14. Damage(s) or injuries caused by infringement such as any data, audio or video material recorded by the use of aircraft.
15. Damage(s) or injuries caused by the misuse of the battery, protection circuit, RC model and battery chargers.
16. Other losses that are not covered by the scope of DJI Innovations liability.

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